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| 10/713,054 | 11/17/2003 | Masanobu Ogino | 245557US0S X | 1158 |

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| EXAMINER | |
|---|---|
| NGUYEN, THANH T | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2813 | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/713,054 | OGINO ET AL. | |
| | Examiner | Art Unit | |
| | Thanh T. Nguyen | 2813 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *21 May 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) *6-17* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4/18/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Election/Restrictions*

Applicant's election with traverse of specie I in the reply filed on 5/21/07 is acknowledged.

Requirement for restriction practice are set forth in MPEP § 803.

There are two criteria for a proper requirement for restriction between patentable distinct inventions:

1. The inventions must be independent (see MPEP §§ 802.01, 806.04, 808.01) or distinct as claimed (see MPEP §§ 806.05-806.05(i)); and

2. There must be a serious burden on the examiner if restriction is not required (see MPEP §§ 803.02, 806.04(a)-(j), 808.01(a) and 808.02).

The traversal is on the ground(s) that the office has not provided any reasons or examples to support a conclusion that the species are patentably distinct because there is nothing on the record to show the species to be obvious variants. This is not found persuasive because claims 1-5 drawn to the intermediate structure clearly shown in figures 30/34/32/36) while claims 10-13 drawn to the final structure which shown in figures 31/33/35/37. These two species would provide two different products (see figures). Therefore, there is no reason why a search for first species must include a search for the second species as well. The existence of two distinct species, as well as the different classification of two inventions, provide evidence of burden on the examiner in examining both inventions.

Since claims 1-5 are patentable distinct from claims 10-13. The distinctness between a process of making one species to other species made is shown." MPEP § 806.04(f). Serious burden on the examiner is shown according to the criteria of MPEP § 808.02, where one of the following must be supported by appropriate explanation:

1. Separate classification thereof:

This shows that each distinct subject has attained recognition in the art as a separate subject for inventive effort, and also a separate field of search,. Patents need not be cited to show separate classification.

2. A separate status in the art when they are classifiable together;....

3. A different field of search ....

The requirement is still deemed proper and is therefore made FINAL.

***Response to Arguments***

Applicant's arguments filed 1/30/07 have been fully considered but they are not persuasive.

***Information Disclosure Statement***

The IDS filed on 4/18/07 has been considered.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Menegoli (U.S. Patent No. 6,133,107).

Referring to figures 12-14, Menegoli a semiconductor substrate comprising:

a lightly doped substrate (50, P-) that contains impurities at a low concentration (see figure 12, col. 4, lines 66-67);

a heavily doped diffusion layer (54, N+, see figure 12, col. 5, lines 3-10) which entirely covers a top of the lightly doped substrate (50) and is higher impurity concentration than the lightly doped substrate (see col. 4, lines 66-67, col. 1-10); and

an epitaxial layer (60, col. 5, lines 22-26) which entirely covers a top of the heavily doped diffusion layer and contains impurities at a lower concentration than the heavily doped diffusion layer (see figure 12, col. 5, lines 22-26).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Menegoli (U.S. Patent No. 6,133,107) as applied to claim 1 above, in view of the Admitted Prior Art of the Present Invention, pages 1-4 and further in view of Werner (U.S. Patent No. 6,469,365).

Menegoli teaches a semiconductor substrate having a lightly doped (p-type), heavily doped and an epitaxialy layer, wherein the heavily doped diffusion layer and the epitaxial layer are of the same conductivity type (see figure 12-14, wherein both heavily doped and epitaxial layer are p-type). However, the reference does not teach the light doped substrate contains phosphorus or boron, the resistance of the epitaxial layer is 10Ωcm or less, and the lightly doped substrate and the heavily doped diffusion layer are of a first conductivity type, and the epitaxial layer is of a second conductivity type.

The Admitted prior art teaches the lightly doped substrate contains phosphorus or boron (see page 1, lines 20-25, meeting claim 2), the resistance of the epitaxial layer is 10Ωcm or less (see page 4, lines 12-13, meeting claim 3).

Therefore, it would have been obvious to a person of ordinary skill in the requisite art at the time of the invention was made would form a device having the light doped substrate contains phosphorus or boron, the resistance of the epitaxial layer is 10Ωcm or less in process of

Menegoli as taught by the Admitted Prior because doping the material into the layer to improve the conductivity of the device.

Werner teaches forming a lightly doped substrate (p-), the heavily doped diffusion layer (p+), and the epitaxial layer (P) is of the same conductivity type (see figure 1, meeting claim 4).

Therefore, it would have been obvious to a person of ordinary skill in the requisite art at the time of the invention was made would form forming a lightly doped substrate (p-), the heavily doped diffusion layer (p+), and the epitaxial layer (P) is of the same conductivity type in process of Menegoli as taught by Werner because changing the conductivity type would provide a desire device.

It is known in the art to have the lightly doped substrate and the heavily doped diffusion layer are of a first conductivity type, and the epitaxial layer is of a second conductivity type.

Therefore, it would have been obvious to a person of ordinary skill in the requisite art at the time of the invention was made would form the lightly doped substrate and the heavily doped diffusion layer are of a first conductivity type, and the epitaxial layer is of a second conductivity type in process of Menegoli because changing the conductivity type would provide a desire device.

***Response to Arguments***

Applicant's arguments filed 1/30/07 have been fully considered but they are not persuasive.

Applicant contends that Menegoli does not teach heavily doped diffusion layer entirely covers a top of the lightly doped substrate and is higher in impurity concentration than the lightly

doped substrate. This is not found persuasive because Menegoli clearly teach a heavily doped diffusion layer (54, N+, see figure 12, col. 5, lines 3-10) which entirely covers a top of the lightly doped substrate (50) and is higher impurity concentration than the lightly doped substrate (see col. 4, lines 66-67, col. 1-10). It is noted that entirely covers a top of the lightly doped substrate (50) (see figures 12-14, it is also noted that the instant invention disclose one MOSFET, nowhere in the claim suggests that the transistor has to be an array of transistor).

The additional references cited in form PTO-892 show further analogous circuitry. Specifically references (Werner, 6469365; Lee, 2002/0063266) are particularly relevant to claimed device and manufacture which recited in claims 1-5, 10-13. These references are deemed relevant and should be carefully reviewed before any amendment is filed.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Nguyen whose telephone number is (571) 272-1695, or by Email via address Thanh.Nguyen@uspto.gov. The examiner can normally be reached on Monday-Thursday from 6:00AM to 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached on (571) 272-1702. The fax phone number for this Group is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pairdirect.uspto.gov. Should you have questions on access to thy Private PAIR system, contact the Electronic Business center (EBC) at 866-217-9197 (toll-free).

Thanh Nguyen
Patent Examiner
Patent Examining Group 2800

TTN